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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

First Bald Eagle Eggs Collected for Analysis in Arizona

Teryl G. Grubb¹ and Duane M. Rubink²

Abstract

In 1977 two cold eggs, 27 days developed, were taken from a fallen nest and a third was retrieved from a nest abandoned after unsuccessful incubation. Eggshells were 7-15% thinner than pre-DDT norms, but pesticide levels appeared too low to cause reproductive problems.

Keywords: *Haliaeetus leucocephalus leucocephalus*, eggs, pesticide levels.

The presence of nesting Southern Bald Eagles (*Haliaeetus leucocephalus leucocephalus*) in Arizona has long been documented (Bent 1937, Mearns 1890); however the breeding population is relatively small (Rubink and Podborny 1975), with only eight occupied territories known in 1977. As a result, descriptive information on Bald Eagle eggs has been lacking for Arizona until now. The eggs described in this report are the first collected for analysis in the State.

Egg Collection

Eggs A and B were recovered from a fallen eyrie north of Phoenix. The nest had been built about 35-40 feet above the ground in a dead, leaning cottonwood (*Populus fremontii*). Normal incubation was last observed on February 16, 1977. On March 1, the

fallen tree was discovered; it had probably blown down during high winds of the previous week. The nest remained intact and nearly upright in its supporting branches on the ground.

The cold eggs were buried under several inches of nest lining and were not visible until some of the lining was removed. Evidently an adult had buried the eggs prior to the fall; or the mishap occurred when both the birds were off the nest, in which case they may have concealed the eggs before leaving. Later analysis showed the eggs to be about 27 days developed when the nest fell. Although both adults were present in the territory when the eggs were recovered, they showed no particular attachment to the specific site nor any special alarm at the intrusion. Subsequent observations through May 1 failed to show any evidence of a renesting attempt.

Egg C came from an eyrie near the town of Camp Verde. Incubation was first observed at this cliff site on March 1, 1977. The following week local biologists saw an egg from the cliff above. When incubation exceeded the usual 35 days and continued well into April, the nest was checked two or three times per week from a safe vantage point across the river.

On May 4, the incubating bird was noticeably restless, changing position more often and standing at the nest edge longer than usual. By May 6, after nearly 10

¹Wildlife biologist, Rocky Mountain Forest and Range Experiment Station, located at Tempe, in cooperation with Arizona State University. Station's central headquarters maintained at Fort Collins, in cooperation with Colorado State University.

²State supervisor, Division of Wildlife Service, U.S. Fish and Wildlife Service, Phoenix, Ariz.

weeks of incubation, the eagles had abandoned the nest. They were observed only once that day as they flew down the canyon without stopping at the eyrie. The birds were also absent the next day when the egg was collected. It showed no signs of development although its exterior surface was polished from the long incubation.

Measurement and Analysis

All three eggs were sent to the U.S. Fish and Wildlife Service Wildlife Research Center at Patuxent, Md. for analysis (tables 1 and 2). There are no data on pre-1946 (pre-DDT) shell thickness norms for Arizona. However, the figure for Bald Eagle eggs from Florida is 0.584 mm; from Texas and Louisiana,

0.6032 mm; and from California and Baja, 0.5836 mm (Anderson and Hickey 1972, D. W. Anderson, unpubl. data). Depending upon which of these figures is used for comparison, eggshells A and B appear 10-15% thinner than pre-1946 norms, while C may be reduced by about 7-10%.

The levels of all chemical residues found were low, except for the moderate concentration of DDE. Although these levels of DDE could account for the eggshell thinning, they do not seem high enough to cause reproductive problems (Krantz et al. 1970; Wiemeyer et al. 1972). Slightly higher levels of most compounds in egg C may be a result of the nest location less than 4 miles downstream from heavy agricultural activity; however, none of these levels appear sufficient to have caused the egg's failure.

Table 1.—Physical measurements of three Bald Eagle eggs recovered from two Arizona eyries along the Verde River in 1977.

Characteristics	Egg			Average
	A	B	C	
Length (mm)	72.1	70.1	69.2	70.5
Breadth (mm)	52.9	53.8	54.9	53.9
Estimated volume (cc)	107.0	105.0	106.0	106.0
Total weight (g)	89.41	92.98	77.99	—
Shell thickness (mm)	0.513	0.525	0.54	0.526
Development (days)	27.0	27.0	0.0	—

Table 2.—Results of chemical analyses on three Bald Eagle eggs recovered from two Arizona eyries along the Verde River in 1977. (ppm corrected wet weight; lower limit of detection is 0.05 ppm, prior to correction for dehydration. "-" indicates not detected.)

Compound	Egg		
	A	B	C
p,p'-DDE	6.8	9.0	4.9
p,p'-DDD	0.14	0.11	0.13
p,p'-DDT	—	—	—
Dieldrin	0.13	0.14	0.20
Heptachlor epoxide	—	—	—
Oxychlordane	—	—	—
cis-Chlordane	0.06	0.07	0.09
cis-Nonachlor	0.04	0.05	0.07
trans-Nonachlor	0.15	0.11	0.21
Endrin	—	—	—
Est. Toxaphene	—	—	0.04
HCB	—	—	—
Mirex	—	—	—
Est. PCB	1.2	1.7	8.5

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